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88419

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B006/B056

Text to Fig. 1: 1) Generator (150 kw, 42 - 50 Mc), 2) Oscillation circuit. 3) Solenoid for producing the magnetic longitudinal field (H_{max} = 16 koe). 4) Capacitor battery for feeding the solenoid. 5) Cylindrical glass vacuum chamber. 6) Evacuation system. 7) Sounding shf generator (λ = 3 cm). 8) Magnetic probe. 9) Double electric probes. 10) to the oscilloscope.

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88420
S/056/60/039/006/004/063
B006/B056

9.9845
26.2321

AUTHORS: Patrushev, B. I., Rusanov, V. D., Kovan, I. A., Savichev, V.Y., Frank-Kamenetskiy, D. A.

TITLE: Gyrotropic Properties of a Plasma During the Propagation of an Extraordinary Wave

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 6 (12), pp. 1503 - 1507

TEXT: This is a report on investigations of the propagation of electromagnetic waves in a cylindrical plasma column, which is located in a homogeneous quasistatic magnetic field H_o. The hydrogen plasma (8.10^{-4} mm Hg) was generated by means of an ionization generator (50 Mc/sec, 150 kw) in a glass cylinder. The high-frequency magnetic field coincided with the static field as to direction. A detailed description of the experimental arrangement is given in Ref. 1. The plane-polarized waves were produced by a sounding generator with 29 Mc/sec and 500 w, whose operation was not disturbed by discharges. The block diagram for investigating the signal from the magnetic probe, located in the anodic circuit of the sounding

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Gyrotropic Properties of a Plasma During the Propagation of an Extraordinary Wave

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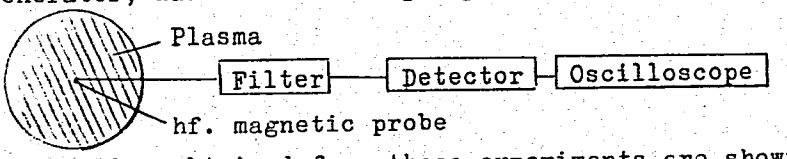
generator, had the following aspect:



The results obtained from these experiments are shown in a number of oscillograms and are numerically given in a Table. It could be proven that in the propagation of a wave whose frequency is between the ion- and electron cyclotron frequencies, both the wave vector and the polarization vector rotate in the plasma waveguide. This result is of interest for the retaining and hf-heating of plasma. The authors thank Ye. K. Zavoyskiy for his interest and L. I. Rudakov for discussions. There are 10 figures, 1 table, and 6 Soviet references.

SUBMITTED: April 23, 1960

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88420

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B006/B056

i	H_0, Oe	n	$\varepsilon_{\parallel}$	$\lambda_{p.l.}$ μ	ω_e	ω_l
1	450	$6 \cdot 10^{18}$	13300	8,6	$7,8 \cdot 10^9$	$4,3 \cdot 10^6$
2	1370	$6 \cdot 10^{18}$	4400	13	$24 \cdot 10^9$	$13,3 \cdot 10^6$
3	2280	$5 \cdot 10^{18}$	2200	19	$39 \cdot 10^9$	$22 \cdot 10^6$

X

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Text to the Table: i denotes the amplification of the passing signal, n - the plasma density, $\varepsilon_{\parallel}$ the longitudinal component of the dielectric constant, λ_{pl} the wavelength in the plasma, ω_e the electron- and ω_i the ion cyclotron frequency. The frequency of the sounding generator was $\omega = 18.10^7$.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

22770
S/057/61/031/005/001/020
B104/B205

26.2311

AUTHORS: Zavoyskiy, Ye. K., Kovan, I. A., Patrushev, B. I., Rusanov, V. D., and Frank-Kamenetskiy, D. A.

TITLE: Magnetosonic method of plasma ionization

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 5, 1961, 513-517

TEXT: The conventional methods of producing concentrated plasma are discussed in the introduction. It is noted that the application of these methods to a magnetic field is limited. The thermal method can only be used for atoms of low ionization potentials. Ionization by longitudinal current causes instabilities, and ionization by an oscillating electron beam meets with experimental and technical difficulties. The concentration of plasma attainable by h-f discharge is limited by the plasma frequency, and the production of concentrated plasma by a longitudinal alternating field requires the use of millimeter and sub-millimeter waves. The authors tested several methods of obtaining concentrated plasma, which are not limited by the plasma frequency. This is achieved by an alternating electric field, the electric vector of which is perpendicular to a

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Magnetosonic method...

static magnetic field. This method makes it possible to use electron and ion-cyclotron or magnetosonic resonances. The latter method is not limited as to the attainable plasma concentration. It makes use of magnetosonic oscillations of a limited plasma volume, and from the theory of these oscillations it follows that the velocity amplitude of the azimuthal electron drift is given by $v_e = \omega V/\omega_i$ (1), where V denotes the velocity amplitude of the radial plasma motion. For the kinetic electron energy one has

$$E = \frac{mv_e^2}{2} = \frac{1}{2}\frac{\omega^2}{\omega_i\omega_e}\frac{\tilde{H}^2}{4\pi n_e}. \qquad (3)$$

where H_o indicates the strength of the static magnetic field, $\tilde{H}$ the amplitude of the alternating magnetic field, and ω its frequency; ω_e and ω_i are the electron and ion cyclotron frequencies, respectively, and n_e denotes the electron concentrations. Ionization by radial magnetic sound is possible if its energy is higher than the ionization energy. It is obvious that the required amplitude of the alternating field is the higher, the higher are the concentration and strength of the static field. With a

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Magnetosonic method...

given amplitude of the h-f field $\tilde{H}$ and a given plasma concentration, there exists a threshold H^* of the static field strength above which ionization will not be possible any longer. By increasing the amplitude of the h-f field, the strength of the static field and the attainable plasma concentration can be extended infinitely. In a strong static field, however, a very strong alternating field is required for obtaining high concentrations by radial magnetic sound. Ionization by magnetic sound has been observed experimentally in a quasi-static field in several installations. Effective ionization occurred both below and above the hybrid frequency, resulting in concentrations of more than 10^{13} cm^{-3}. The ionization had the nature of resonance and was always accompanied by the penetration of an alternating field into the plasma. Fig. 1 shows resonance ionization by a h-f magnetic field with an increase of the quasi-static magnetic field in time. By blanking a 3-cm probe signal it was possible to indicate a concentration higher than 10^{12} cm^{-3}. The penetration of an external h-f field was observed by means of a magnetic probe introduced into the discharge space. In fields larger than H^*, concentration dropped considerably. It could be shown that in experiments

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B104/B205

Magnetosonic method...

with a quasi-static magnetic field, H^* is a linear function of $\tilde{H}$. This can be explained by formula (3). The calculated values of H^* are somewhat lower than the experimental ones, i.e., ionization can be achieved more easily than would have been expected from the drift. This can be ascribed to longitudinal currents which are due to the fact that the oscillations are not completely radial. Based on these results the authors designed the model of a plasma source with magnetosonic ionization. The plasma comes from the source which is placed in a magnetic field and flows along the field into a measuring volume. In previous experiments, a plasma column having a diameter of 6 cm and a concentration of 10^{12} cm^{-3} was obtained in the measuring volume at a rated power of the ionization generator of 4 kw. The experiments were made above the hybrid frequency, in weak magnetic fields where the drift motion imparts energy to the electrons, which is sufficiently high for ionization. There are 4 figures and 8 references: 7 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: P. C. Thonemann et al., Nature, 181, 217 1958.

SUBMITTED: July 21, 1960

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V. D.

2

S/056/61/041/002/001/028
B102/B205

26.2321

AUTHORS: Borodin, A. V., Gavrin, P. P., Kovan, I. A., Patrushev, B. I., Nedoseyev, S. L., Rusanov, V. D., Frank-Kamenetskiy, D. A.

TITLE: Magnetoacoustic oscillations and the instability of an induction pinch

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 2(8), 1961, 317 - 321

TEXT: The results of experiments on a plasma pinch are presented. The experimental arrangement used is schematically shown in Fig.1. A vacuum chamber (10^{-7}mm Hg, 450 - 500°C) made of quartz served as discharge space. Most experiments were performed in air (10^{-1} - 10^{-2}mm Hg), and some of them in hydrogen, argon, xenon, and helium (10^{-1} - 10^{-3}mm Hg). The magnetic field was generated by a homogeneous turn with an inductance of 30 cm, and a 200-kw h-f generator was used for pre-ionization. The

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behaviour of the discharge was studied with the aid of a quick-acting photorecorder, type COP- 2M(SFR - 2M), and a magnetic probe. The directions of photographing are indicated in Fig.1 Pictures taken in the axial direction show that the incandescence of the gas in the first semiperiod appears in the form of an annular tube. This indicates that the radial oscillations originate from the cold plasma contained in the incandescing tube. Pictures were taken in intervals of 0.3 μsec. The first pinch is attributed to the formation of a relatively weak shock wave. In air with a pressure of 8.10^{-2} mm Hg, the shock wave has a velocity of $2.3.10^{6}$ cm/sec and a front width of ~0.7 cm. The discontinuity of the magnetic field at the axis is explained by collisions of strong shock waves. The radial oscillations are ascribed to magnetoacoustic oscillations of the plasma column. The boundary conditions prevailing in this case are analyzed in the following. The analysis is complicated by the fact that the plasma column is copper-shielded. The authors discuss two limiting cases, one of which is based on the assumption that the plasma oscillates as if it were completely enclosed by a copper shield. This assumption was found to be correct. The boundary condition $J_1(kR) = 0$, where $kR = \mu = 1.84, 5.3, \ldots$

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(J - Bessel function), is satisfied here. Using results of Frank-Kamenetskiy the authors obtain the following relation for the frequency of magnetoacoustic oscillations: $f = \mu_{nm} H_o / 2\pi R \sqrt{4\pi M (n_o + n_1)}$, where M is the ion mass, n_1 is the ion concentration, and n_o is the concentration of neutral particles. A comparison between experimental and theoretical results obtained for H_2, N_2, and Ar shows that: 1) the dependence of the eigenfrequency on the gas mass is in good agreement with theory; 2) the agreement between the theoretical and experimental absolute values of the frequencies is worse, since many important facts have not been considered. Conclusions: Rapid transverse contraction of plasma results in the occurrence of free magnetoacoustic oscillations of the plasma column, which are damped in time. At the instant of maximum contraction of the annular tube of the plasma, "tongues" protruding along the field are ejected (inertial instability). The excitation of oscillations may be attributed to the rapid contraction of the annular tube without a field. The contraction is caused by shock waves. The tube is formed by the mixing of

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the fields inside and outside the plasma, which have opposite directions. Ye. K. Zavoyskiy is thanked for his interest in the work, and L. I. Rudakov for discussions. There are 6 figures, 1 table, and 10 references: 7 Soviet and 3 non-Soviet.

SUBMITTED: January 27, 1961

Legend to Fig.1: 1) 50-kv rectifier; 2) capacitor bank (27 μf, 50 kv); 3) gap in the turn for photographing; 4) turn for generating the magnetic field; 5) quartz vacuum chamber; 6) and 8) h-f generator; 7) magnetic probe; 9) starter; a) to pump; b) to oscilloscope; c) directions of photographing.

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PHASE I BOOK EXPLOITATION SOV/6368

Rusanov, Vladimir Dmitriyevich

Sovremennyye metody issledovaniya plazmy (Modern Methods in Plasma Research) Moscow, Gosatomizdat, 1962. 182 p. Errata slip inserted. 6300 copies printed.

Ed.: A. I. Voronova; Tech. Ed.: S. M. Popova.

PURPOSE: This book is intended for scientific personnel in the field of plasma physics.

COVERAGE: This book presents methods for investigation of the physical state of plasma in connection with the direct conversion of thermal energy into electric energy and the construction of a reaction engine utilizing plasma as a means of propulsion. Attention is directed to the investigation by sounding and optical methods of such parameters as concentration of charged particles and temperature. The author expresses his gratitude to D. A. Frank-Kamenetskiy initiator of the work, to L. A. Artsimovich, V. L. Vdovin, Ye. K. Zavoyskiy, V. I. Kogan, I. A. Kovan, B. I. Patrushev, Ya. R. Rakhimbabayev, V. P. Smirnov, A. V. Titov, and V. D. Shafranov for

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their critical remarks, and to N. V. Rusanova for her aid in preparing the material for printing. There are 175 references, 99 of which are Soviet.

TABLE OF CONTENTS:

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

KOVAN, I.A.; PATRUSHEV, B.I.; RUBANOV, V.D.; TILININ, G.N.; FRANK-KAMENETSKIY, D.A.

Effect of spatial amplification of variable magnetic fields in the case of magnetoacoustic resonance in a plasma. Zhur. eksp. i teor. fiz. 43 no.1:16-20 Jl '62. (MIRA 15:9)
(Magnetic fields) (Plasma (Ionized gases))

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

ACCESSION NR: AT4025310 S/0000/63/000/000/0199/0211

AUTHORS: Kozlov, O. V.; Rodin, A. M.; Rusanov, V. D.; Skoblo, Yu. A.; Chernetskiy, A. V.

TITLE: Plasma diagnostics by atom and ion beams

SOURCE: Diagnostika plazmy* (Plasma diagnostics); sb. statey. Moscow, Gosatomizdat, 1963, 199-211

TOPIC TAGS: plasma interaction, discharge plasma, gas discharge, magnetic analysis, charge exchange, plasma research, ion beam, atom beam

ABSTRACT: Apparatus is described for the probing of a plasma of an oscillating discharge in gas by means of accelerated and focused ion beams or by means of charge-exchanged atom beams. Formulas are derived for the attenuation of ion beams in gases and are found to be in good agreement with experiments for the pairs $Ar^+ \rightarrow Ar$, $He^+ \rightarrow$

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ACCESSION NR: AT4025310

$\rightarrow$ He, $H^+ \rightarrow H_2$, $He^+ \rightarrow$ Ar and others. The discrepancy between the experimental and calculated data becomes appreciable at high pressures. The limiting pressure amounted to (2--3) x 10^{15} cm^{-2} for the pair $Ar^+ \rightarrow$ Ar with Ar^+ energy 10 keV and about 10^{16} cm^{-2} for the $H^+ \rightarrow H_2$ pair. Analogous results were obtained by measuring the broadening of the lines of the magnetic-analyzer spectrum. Measurements were also made of the dependence of the ion density on the discharge current. Apparatus was developed for the study of magnetosonic resonance and used to measure the attenuation of atomic argon beams in a hydrogen plasma, atomic helium beams in a helium plasma, and atomic argon beams in helium plasma. It is concluded that in spite of certain difficulties, the method of determining plasma parameters by means of beams of fast particles is worthy of serious attention, since it has undisputed advantages (practical elimination of contacts, locality of probing, wide range of measured quantities, and possibility of quantitative determination of the plasma composition). It is also concluded that atomic beams are

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ACCESSION NR: AT4025310

more suitable for the determination of characteristics of charged particles. The operating speed of measurements with particle beams can be made quite high, with a low resolution time. Orig. art. has: 7 figures and 6 formulas.

ASSOCIATION: None

SUBMITTED: 19Oct63 DATE ACQ: 16Apr64 ENCL: 02

SUB CODE: ME NR REF SOV: 004 OTHER: 004

Card 3/5

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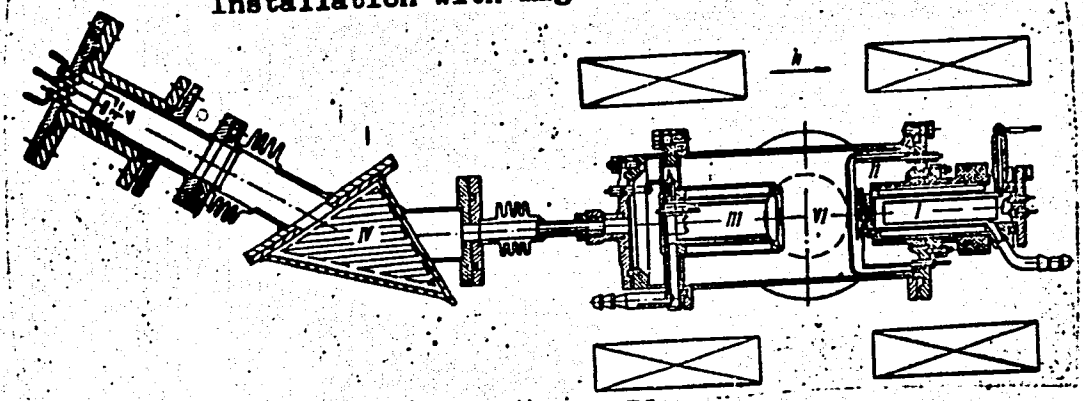
ENCLOSURE: 01

ACCESSION NR: AT4025310

Installation with magnetic analyzer



I - source, II - focusing electrode system,
III - gas discharge chamber, IV - magnetic analyzer
V - collector, VI - vacuum pump unit

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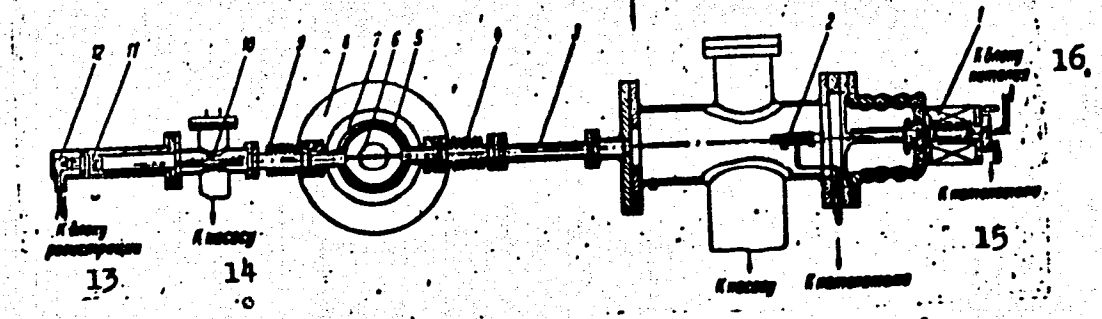
"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

ENCLOSURE: 02

ACCESSSION NR: AT4025310



Sounding of a plasma with a high-frequency pulsed installation:

1 - ion source, 2 - charge exchange chamber, 3 - transition tube, 4 - bellows connection, 5 - gas discharge glass tube, 6 - plasma pinch, 7 - screen, 8 - magnetic core, 9 - bellows connection, 10 - deflecting plates, 11 - collector unit, 12 -cathode follower, 13 - to registration block, 14 - to pump, 15 - to leak valve, 16 - to supply block

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

ACCESSION NR: AT4025314 S/0000/63/000/000/0237/0246

AUTHORS: Kovan, I. A.; Moskvin, Yu. L.; Rusanov, V. D.; Smirnov, V. P.

TITLE: Investigation of plasma parameters in a strong magnetic field with the aid of double electric probes

SOURCE: Diagnostika plazmy* (Plasma diagnostics); sb. statey. Moscow, Gosatomizdat, 1963, 237-246

TOPIC TAGS: plasma, plasma diagnostics, probe method, double probe method, plasma in strong magnetic field, probe method accuracy, Larmor radius, probe characteristic dimensions, charged particle density, electron temperature, saturation current, effect of probe size, probe current, probe current derivative

ABSTRACT: In view of the doubtful reliability of data obtained with probes on a plasma in a strong magnetic field, when the particle

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ACCESSION NR: AT4025314

Larmor radius is comparable with the probe characteristic dimension, the authors have checked on the probe readings by other diagnostic means. The plasma parameters measured were electron temperature and charged-particle density at saturation. The electron temperature was determined by plotting the derivative of the current with respect to the voltage against the probe voltage. The charged-particle density was measured by determining the saturation current and also by measuring the derivative of the probe current with respect to the voltage in the vicinity of zero voltage. The effect of the probe size was also investigated. It is shown that the probe measurements deviate from the others by as much as 40% and become particularly unreliable in strong magnetic fields. Orig. art. has: 5 figures.

ASSOCIATION: None

SUBMITTED: 19Oct63 DATE ACQ: 16Apr64 ENCL: 01

SUB CODE: PH NO REF SOV: 005 OTHER: 003

Card 2/3

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

L 20385-66 EWT(1)/ETC(f)/EPF(n)-2/EWG(m)/ETC(m)-6 IJP(c) WW/AT

ACC NR: AT6001560 SOURCE CODE: UR/3136/65/000/911/0001/0020

AUTHOR: Kovan, I. A.; Podgornyy, I. M.; Rusanov, V. D.; Smirnov, V. P.; Spektor, A. M.; Frank-Kamenetskiy, D. A. 72

ORG: Institute of Atomic Energy im. I. V. Kurchatov (Institut atomnoy energii) 68 BH

TITLE: Magnetosonic heating of a plasma 21

SOURCE: Moscow. Institut atomnoy energii. Doklady, IAE-911, 1965. Magnitno-zvukovoy nagrev plazmy, 1-20

TOPIC TAGS: magnetoacoustic effect, magnetoactive plasma, plasma resonance, plasma waveguide, plasma oscillation, plasma heating, magnetic trap/ Vega

ABSTRACT: The authors present results of a study of excitation, propagation, and absorption of oblique magnetic-sound waves in a hydrogen or helium plasma at 10--30 Mcs. More attention than in the past is paid to the excitation of magnetic-sound waves, and particularly magnetic-sound resonance in a confined plasma. Various experiments with direct magnetic-sound waves are discussed and experiments aimed at heating plasma with the aid of oblique waves and magnetic-sound resonance are described. A "Vega" adiabatic trap with high frequency source of cold plasma, designed for this purpose is briefly described. The plasma in these experiments was produced by high frequency discharge, using generators operating at 20--50 Mcs

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ACC NR: AT6001560

with a nominal power of ~200 kw. The transverse field was produced by discharging a capacitor through a solenoid. The magnetic-field pulse was 20 msec. The investigations have shown that when beyond-cutoff plasma-waveguide conditions are produced resonance accumulation of energy is possible in the plasma column when the magnetic sound wave propagates almost transverse to the static magnetic field. This phenomenon is treated as magnetic-sound resonance at lower radial modes. The spatial amplification obtained in strong magnetic fields corresponds to a resonator Q ~ 15, assuming that only transverse waves are excited in the resonator. This value of Q is limited by dissipative mechanisms, particularly nonlinear processes. The study of the oblique magnetic-sound waves has shown that the dissipative processes can be more intense here and that in the case of nonstationary waves of large amplitude a nonlinear dissipation, connected with collective mechanisms, can arise. The experiments have also shown that such a wave can be used to transfer energy effectively to the electronic component. The two plasma heating methods considered (resonant and shock-wave) can be particularly promising for the production of hot plasma in toroidal traps. The authors thank Ye. K. Zavoyskiy, M. A. Leontovich, B. B. Kadomtsev, and V. D. Shafranov for numerous discussions. Orig. art. has: 11 figures and 11 formulas.

SUB CODE: 20/ SUBM DATE: none / ORIG REF: 028/ OTH REF: 003

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L 11892-66 EWT(1)/EPF(n)-2/ETC(m) IJP(c) WW

ACC NR: AP5028012 SOURCE CODE: UR/0386/65/002/008/0356/0360

AUTHOR: Rusanov, V. D. Smirnov, V. P.

ORG: none

TITLE: Investigation of oblique magnetic sound waves of large amplitude

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu (Prilozheniye), v. 2, no. 8, 1965, 356-360

TOPIC TAGS: magnetoacoustic effect, shock wave formation, nonlinear effect

ABSTRACT: This is a continuation of earlier investigations of linear oblique magnetic-sound waves (sometimes called whistles) (with I. A. Kovan et al., Conference on Plasma Physics, Salzburg, 1961, p. 205), and is devoted to an investigation of the transition to nonlinear waves. Large-amplitude shock waves were excited by a shock circuit of 15 Mc frequency. The magnetic field in the center of the exciting coil, which was 30 mm long and 40 mm in radius, increased to 800 oe within 2×10^{-8} sec (Fig. 1). The magnetic field in the homogeneous part of the solenoid ranged from 200 to 2000 oe. The measurements were made for values of $q = H_{z.max}/H_0$ ($H_{z.max}$--maximum value of the magnetic field in the circuit in the center of the group in the absence of a plasma, H_0--constant magnetic field) ranging from 0.2 to 1.7. The distance from the center of the loop to the magnetic probe ranged from 0 to 40 cm. The results confirmed experimentally the influence of the wave magnetic field on the wave propagation velocity. In addition, the dependence of the maximum wave magnetic field on the maximum excitation field was investigated. From the observed dependence of

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ACC NR: AP5028012

the maximum wave magnetic field on the maximum excitation field and from measurements of the damping decrement of the circuit as a function of q it is concluded that oblique nonstationary waves, with nonlinear propagation and damping, were obtained in the experiments. For the limiting values of the parameter q, these waves are similar in structure to oblique shock waves. Authors are grateful to Ye. K. Zavoyskiy for continuous interest in the work and to Yu. G. Kalinin for participating in the work. Orig. art. has: 2 figures.

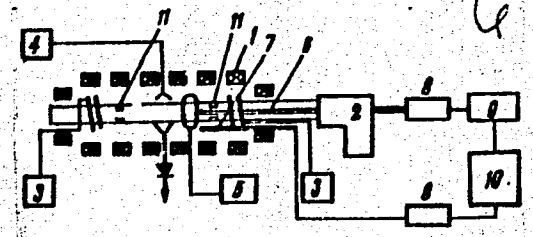

Fig. 1. Diagram of setup.

1 - Magnetic-field solenoid; 2 - vacuum system with discharge volume; 3 - high-frequency generator; 4 - microwave diagnostics system; 5 - shock circuit; 6 - measuring probe; 7 - starting probe; 8 - delay line; 9 - amplifier; 10 - oscilloscope; 11 - diaphragms.

SUB CODE: 20/ SUBM DATE: 02Aug65/ ORIG REF: 004/ OTH REF: 001

HW

Card 2/2

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L 54782-65 EWT(l)/EEC(k)-2/EPF(n)-2/EWG(m)/EEC-4/EPA(w)-2/EED-2/FCS(k)/EWA(h)
Pn-4/Pz-6/Po-4/Pab-10/Pac-4/Peb/Pi-4/Pj-4/Pl-4 IJP(c) WW/AT/WB
ACCESSION NR: AP5014542 UR/0089/65/018/005/0515/0516

AUTHOR: Balakhanov, V. Ya.; Rusanov, V. D.; Striganov, A. R.

TITLE: Determination of the parameters of a plasma with the aid of a multi-beam radio interferometer

SOURCE: Atomnaya energiya, v. 18, no. 5, 1965, 515-516

TOPIC TAGS: Fabry Perot interferometer, microwave interferometer, plasma diagnostics, electron density

ABSTRACT: This is a sequel to an earlier paper by the authors (Zh. tekhn. fiz. v. 35, 127, 1965), dealing with the possible use of an open resonator of the Fabry-Perot type in the microwave and submillimeter regions of the spectrum to determine the concentration of electrons and the frequency of their collision with heavy particles. The present paper deals with a determination of the electron density in the plasma with the aid of a multibeam Fabry-Perot radio inteferometer. The confocal, cylindrical resonator used for the investigation consisted of a glass vacuum chamber filled with hydrogen to a pressure of 10^{-3} mm Hg. The plasma was produced with a high-frequency discharge in a longitudinal magnetic field of 700 oe intensity. The interferometer was tuned to one of its natural frequencies

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ACCESSION NR: AP5014542

4/

in the absence of a plasma. Introduction of the plasma produced a phase difference between two interfering beams, which was measured by returning the generator and measuring its frequency with a standard wavemeter. The accuracy of the interference method was compared with probe measurements. It is concluded that the sensitivity of the Fabry-Perot interferometer exceeds that of an ordinary two-beam interferometer. It is noted that the system can also be used under pulsed operation, provided the generator can produce a frequency modulated signal with a small characteristic variation time. The results obtained by the probe method did not fully agree with those obtained with the Fabry-Perot inteferometer, but the accuracy of the latter is approximately ± 10%, whereas the accuracy of the probe method is ± 25%. "In conclusion the authors thank Ye. K. Zavoyskiy for interest in the work, V. L. Vdovin for help during the testing of the instrument with the plasma installation constructed by him, and F. A. Korolev and V. I. Gridnev for valuable advice." Orig. art. has: 2 figures, 3 formulas, and 1 table. [02]

ASSOCIATION: none

SUBMITTED: 13Aug64 ENCL: 00 SUB CODE: ME, OP

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L 26980-65 EWT(l)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EWA(m)-2 Pz-6/Po-4/Pab-10/
Pi-4 IJP(c) AT
ACCESSION NR: AP5003246 S/0057/65/035/001/0127/0131

61
57
13

AUTHOR: Balakhanov, V.Ya./ Rusanov, V.D./ Striganov, A.R.

TITLE: A multiple beam radiointerferometer for plasma diagnostics

SOURCE: Zhurnal tekhnicheskoy fiziki, v.35, no.1, 1965, 127-131

TOPIC TAGS: plasma diagnostics, interferometer, microwave plasma

ABSTRACT: A multiple beam microwave interferometer of the Fabry-Perot type is proposed for plasma diagnostics. The multiple beam instrument should have the advantage over the usual two-beam interferometer of greater sensitivity, and it should also permit the measurement of the electron collision frequency. A schematic drawing of the proposed instrument is shown in Enclosure 01. The partially reflecting surfaces would consist of silvered mica sheets from which the silver has been removed in parallel strips to provide the requisite transparency. The theory of the instrument is discussed briefly and it is concluded that it should be possible to measure electron concentrations as low as 1.7×10^9 cm^{-3}. By observing the change in the Q of the instrument due to the introduction of the plasma, it should be possible to measure electron collision frequencies as low as 1.4×10^6 sec^{-1}. Either

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4

a reflector may be moved as in the usual Fabry-Perot interferometer or the exciting frequency may be modulated. In the latter case it would be possible to follow the time development of processes in a pulsed plasma. The use of the confocal Fabry-Perot interferometer is also briefly discussed. This should have some advantages in the case of a cylindrically or spherically symmetric plasma. "In conclusion, the authors express their gratitude to Ye.K.Zavoyskiy for his interest and attention to the work, and also to F.A.Korolev, V.I.Gridnev and O.A.Zinov'yev for discussing it." Orig.art.has: 9 formulas and 2 figures.

ASSOCIATION: none

SUBMITTED: 03Dec63 ENCL: 01 SUB CODE: EC ,ME

NR REF SOV: 002 OTHER: 003

Card 2/3

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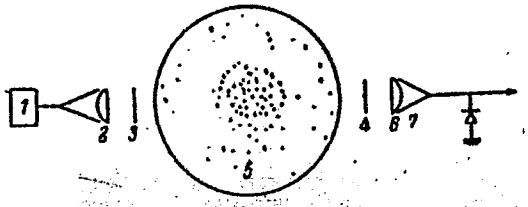
ENCLOSURE: 01



Schematic drawing of the interferometer: 1 - microwave generator, 2,6 - lenses; 3,4 - reflectors; 5 - plasma 7 - receiver.

Card 3/3

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

L 31826-65 EWT(1)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EWA(m)-2 Pi-4/Po-4/Pz-6/
Pab-10 IJP(c) AT
ACCESSION NR: AP5004376 S/0056/65/048/001/0072/0077

AUTHOR: Kovan, I. A.; Kozorovitskiy, L. L.; Rusanov, V. D.; Smirnov, V. P.; Frank-Kamenetskiy, D. A.

TITLE: Magnetosonic resonance in a toroidal system

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 1, 1965, 72-77

TOPIC TAGS: magnetosonic resonance, toroidal plasma system, magnetic sound amplification, plasma heating, Tokomak

ABSTRACT: To provide better conditions for prolonged plasma confinement, the authors used a toroidal chamber with longitudinal current, in which the possibility of excitation of magnetosonic resonance has never been considered previously. The experimental setup is shown in Fig. 1 of the Enclosure. A large ratio of longitudinal magnetic field to the field of the current pinch itself was used to obtain maximum plasma stability. The use of longitudinal currents in conjunction with a metallic screen, as described by V. D. Shafranov (Atom. energ., v. 13, 521, 1962) ensured equilibrium of the plasma column. The magnetic sound was excited by a

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magnetic-field fast-rise and slow-decay pulse of maximum intensity ~ 4 koe and of duration ~ 250 μsec. The longitudinal current was produced by discharging a capacitor in the primary circuit of the toroid transformer, the secondary winding of which was the plasma loop. The maximum electric field intensity in the plasma was 1 v/cm and in most experiments the current did not exceed 1000 amp. The application of the magnetic field produced magnetosonic resonance in the plasma. The maximum electron concentration at the instant of resonance was 9×10^{12} cm^{-3} at approximately the center of the chamber, with a value $6-7 \times 10^{12}$ cm^{-3} averaged over the cross section. The temperature was 5—7 ev, and the value of the quasi-static magnetic field at the instant of resonance was ~1400 oe. The resonant frequency was close to the theoretically calculated value, but the ratio of the amplitude of the high-frequency field in the chamber without a plasma to the amplitude with the plasma was only 1.5—2, so that the increase in the magnetic-sound amplitude along the column axis was not very significant. It is concluded that the effect can be used in high-frequency heating of a plasma in toroidal systems with a strong magnetic field, in equipment of the "Tokomak" or "Stellarator" type. "The authors thank Ye. K. Zavoyskiy for valuable discussions, and A. V. Titov, V. F. Shanskiy, and V. L. Vdovin for participating in the work."
Orig. art. has: 4 figures and 5 formulas. [02]

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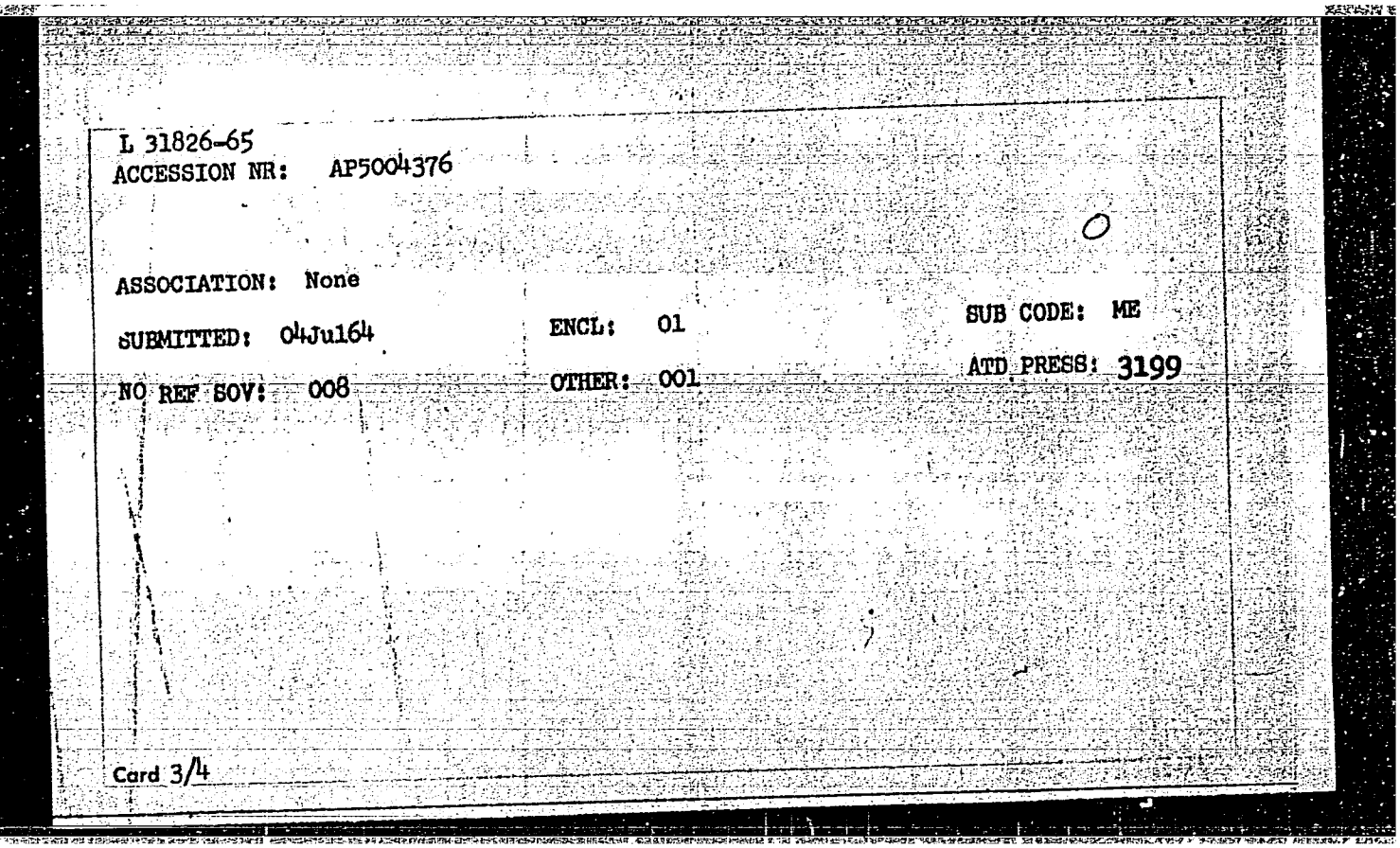

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ACCESSION NR: AP5004376

O

ASSOCIATION: None

SUBMITTED: 04Jul64 ENCL: 01 SUB CODE: ME

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Card 3/4

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ENCLOSURE: 01

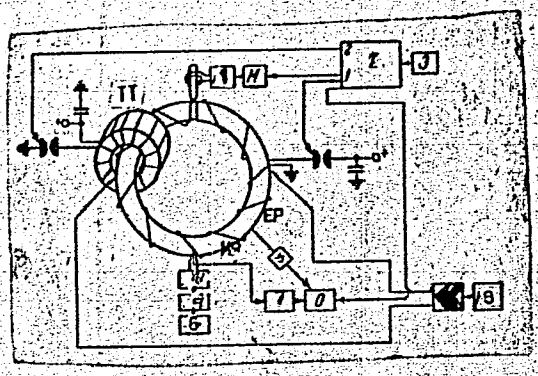

Fig. 1. Diagram of setup

TT - Toroidal transformer; 1, M - generator for preliminary ionization and modulator; 4, 5, 6 - pumping system; 7, O - receiver and oscilloscope; 3 - synchronization block; 8 - excitation generator; MP - magnetic probe; EP - double electric probe.

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L 22410-66 EWT(1)/EPF(n)=2/EWG(m) IJP(c) AT
ACC NR: AP6007953 SOURCE CODE: UR/0089/66/020/002/0143/0149

AUTHORS: Vdovin, V. L.; Podgornyy, I. M.; Rusanov, V. D.

ORG: none

TITLE: Effect of plasma density on the results of spectroscopic determination of the electron temperature.

SOURCE: Atomnaya energiya, v. 20, no. 2, 1966, 148-149

TOPIC TAGS: plasma density, plasma electron temperature, spectral line, helium plasma, hydrogen plasma

ABSTRACT: In view of the fact that the values of the electron temperature determined from the excitation functions of vaious helium lines are not uniquely defined, and are influenced by secondary processes such as the pressure of the neutral helium and the density of the plasma electrons, the authors have undertaken a comparison of the electron temperature as determined with two pairs of lines (4922, 4713, and 5047, 4713 Å) with one another, and also with the results

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of probe measurements. The experiments were made essentially in a helium plasma of high frequency discharge in a magnetic field, in a pressure interval 3 -- 10 μ. The generator frequency was 25 Mc, and the active power fed into the plasma reached 4 kw. The ratio of the spectral-line intensity was determined with a monochromator with photomultiplier. The main measurements were made with a double electric probe that could be displaced radially in the chamber. The plasma density was determined with probe measurements using a Fabry-Perot interferometer operating at 8 mm wavelength. At electron densities $\sim 10^{12}$ cm^{-3} the temperatures obtained by optical measurements using the 4922 and 4713 Å pair exceed by a factor of more than two the results of the probe measurements. The results coincide at $\sim 3 \times 10^{11}$ cm^{-3}. The temperature determined optically for the 5047 and 4713 Å lines is approximately half the temperature obtained with probe measurements at a density $n_e > 6 \times 10^{11}$ cm^{-3}. At lower concentrations the results agree well. Measurements in hydrogen show

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better agreement. It is concluded therefore that the method used to determine the electron temperature from the relative intensity of the helium lines, in the form used in many experiments, can lead to appreciable errors. Orig. art. has: 1 figure

SUB CODE: 20/ SUBM DATE: 01Sep65/ ORIG REF: 002/ OTH REF: 003

Card 3/3 lw

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L 45924-66 EWT(1)/EWP( )/EWT(m)/EEC(k)-2/EWP(j)/T IJP(c) AT/RM/WH

ACC NR: AP6028610 SOURCE CODE: UR/0057/66/036/008/1383/1386

AUTHOR: Balakhanov,V.Ya.; Rusanov,V.D.; Striganov,A.R.

ORG: none

TITLE: Millimeter and submillimeter wavelength interference filters for investigation of plasma radiations

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 8, 1966, 1383-1386

TOPIC TAGS: interferometer, electromagnetic wave interference, interference filter, microwave, microwave filter, plasma radiation, plasma research

ABSTRACT: The authors have previously discussed a Fabry-Perot interferometer for millimeter and submillimeter wavelengths, each of the two mirrors of which consists of a number of parallel metal film bands on a Plexiglas or fused quartz substrate (ZhETF, 35, 127, 1965). In the present paper they discuss an interferometer in which two such mirrors are mounted with their planes parallel but with their respective metallic bands perpendicular to each other ("crossed Fabry-Perot interferometer"). The theory of the crossed interferometer is developed, and it is shown that the instrument can serve as a band pass filter. Such a crossed interference filter, designed for a wavelength of 8.4 mm, was constructed and tested. The mirrors were deposited on in a 9.5 cm diameter circle on 1.05 cm thick Plexiglas substrates. The filter passed 80% of the incident 8.4 mm radiation with a Q-factor of 10, and passed less than 1% of the

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ACC NR: AP6028610

incident 4 mm radiation. It is proposed that such crossed Fabry-Perot interference filters be employed to investigate the electromagnetic radiations of plasmas. The authors thank Ye.K.Zavoyskiy for his interest in the work. Orig. art. has: 9 formulas and 2 figures.

SUB CODE: 20 SUBM DATE: 09Aug65 ORIG. REF: 006 OTH REFE: 008

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

L 22192-66 EPF(n)-2/EWT(1)/ETC(f)/EWG(m) IJP(c) AT

ACC NR: AP6004915 SOURCE CODE: UR/0056/66/050/001/0039/0045

80
77
8

AUTHOR: Vdovin, V. L.; Rusanov, V. D.; Frank-Kamenetskiy, D. A.

ORG: none

TITLE: Investigation of nonpotential drift waves in a stationary magnetoacoustic plasma 21,44 35

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 1, 1966, 39-45

TOPIC TAGS: magnetoactive plasma, magnetoacoustic effect, turbulent plasma, hydrogen plasma, electron temperature, electron density, acoustic noise, drift mobility

ABSTRACT: The purpose of the investigation was to check on the theoretically predicted excitation of solenoidal (nonpotential) drift fluctuations in an inhomogeneous plasma. To this end, the authors investigated magnetic noise in a setup in which the plasma is produced by the magnetoacoustic method in a glass tube situated in a fixed magnetic field (Fig. 1). The plasma flowed continuously along the axis into the measured volume and the magnetic field varied from 700 to 2500 oe. The measurements were made on hydrogen plasma in the pressure range 1×10^{-3}--5×10^{-3} mm Hg. The rf power introduced into the discharge was 4 kw. In this pressure range the electron temperature varies from 4 to 10 ev. The electron density at the

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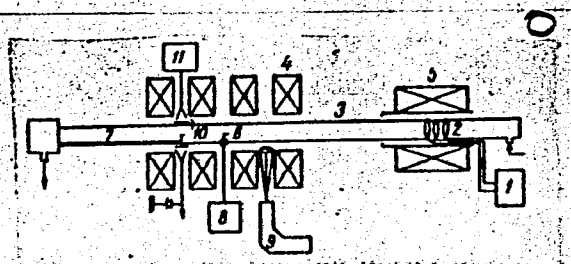

Fig. 1. Diagram of experimental apparatus: 1 - rf generator, 2 - rf coil, 3 - glass tube, 4 - main magnetic field coil, 5 - auxiliary magnetic field coil, 6 - radially movable electric probe, 7 - longitudinally movable electric probe, 8 - spectrum analyzer, 9 - monochromator, 10 - Fabry-Perot interferometer, 11 - signal generator.

center of the chamber was 5×10^{11}--5×10^{12} cm^{-3}. Two diagnostic techniques were used in these experiments, determination of the electron density with a double electric probe and a microwave Fabry-Perot interferometer operating at 8 mm, and determination of the electron temperature by double electric probes and by an optical method. Measurements were made of the spatial distributions of the field components, of the dependence of the frequency on the magnetic field, and of the phase relationships of the oscillations. Two types of magnetic noise were observed. One was a strong solenoidal noise (approximately 0.05 oe) with fundamental frequency of the order of 100 kcs. Its spectrum had a high harmonic content, with most of the noise power concentrated in the harmonics at low pressures. The dependence of this noise on the plasma parameters was investigated and the results are discussed from

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the point of view of possible excitation of Alfven drift waves in the inhomogeneous plasma. In addition to the magnetic noise, intense potential electric fluctuations were observed, similar to those investigated in detail elsewhere (Yadernyy sintez [Nuclear Fusion], 1966, in press). It is deduced that the magnetic fluctuations observed in the present investigation are not a component of the potential fluctuation investigated earlier. The high frequency noise observed in the experiments (3--5 Mcs) is of magnetoacoustic nature, but its excitation is not yet clear. The authors thank Ye. K. Zavoyskiy and L. I. Rudakov for valuable comments and V. Sannikov for help in the experiments. Orig. art. has: 7 figures and 1 formula.

SUB CODE: 20/ SUBM DATE: 02Aug65/ ORIG REF: 005/ OTH REF: 003

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APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V.I.

Thunderstorm during a snowfall. Meteor.i gidrol. no.4:36-37 Ap '56.
(MLRA 9:8)

(Thunderstorms) (Snow)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

MISHAKOV, V.I.

Compilation of bioclimatic characteristics of a health resort. Vop. kur., fizioter. i lech. fiz. kul't. 28 no.4:363-365 Jl-Ag '63. (MIRA 17:9)

1. Moskovskiy institut kurortologii i fizioterapii.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V. I.

AUTHOR: Rusanov, V. I.

TITLE: Synoptic Conditions of Formation of an Unusual Case of Glazed Frost (Sinopticheskiye usloviya obrazovaniya redkogo sluchaya gololeda)

PERIODICAL: Meteorologiya i Gidrologiya, 1957, No. 2, pp. 28-29 (U.S.S.R.)

ABSTRACT: Glazed frost was recorded on 8 January 1956 at the Pudino Meteorological station in the Tomsk region accompanied by the following conditions. On this date, air t° rose from -17.5° at 1300 hours to -14.9° at 1900 hours; relative humidity rose from 77% at 0700 hours to 87% at 1900 hours; wind during the 24 hour period was initially southerly, veering to southsouthwest with speed of 2-3 m/sec; the sky was solidly overcast with strato-cumulus clouds, the lower limit of which dropped from 720 m. at 1300 hours to 300 m. at 1900 hours. Light snowfall began at 0000 hours on 8 Jan. continuing erratically until 1715 hours, followed by a drizzle which persisted until 1900 hours. The total precipitation was 0.3 mm. As drizzle fell, glazed frost began to form, lasting until 1615 hours on 9 Jan.

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Synoptic Conditions of Formation of an Unusual Case of Glazed Frost

This weather was caused by a powerful flow of warm, moist air, the intrusion of which occurred in the system of the Low encompassing all Western Siberia with a center over the Kara Sea. The Pudino station was in the warm sector of the Low before the polar front. Air t° at Igarka was -5°, at Khanty-Mansiysk, -7°, and -15° at Pudino. Inversion of air t° was noted at Novo-Sibirsk, Pudino, Aleksandrovsk, Omsk, and other points.

Cold continental air was developed in a High, centered over Altai Mts. with a pressure of 1050 mb. Low air t° were recorded in the south of Western Siberia: -24° in Barnaul and -37° in Ust' Ulagan. Under such synoptic conditions, supercooled rain forms, leading to the formation of glazed frost at an air t° of -14.9°.

Card 2/4

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Synoptic Conditions of Formation of an Unusual Case of Glazed Frost

At Kargask, under the same synoptic conditions, the fall of supercooled rain with snow and formation of glazed frost was recorded on 9 Jan. 1956 from 0515 hours to 0815 hours; on 10 Jan. 1956, supercooled drizzle and glazed frost formation were recorded for both Pudino and Kargask.

The examples cited demonstrate that glazed frost formation within U.S.S.R. territory can take place at temperatures much below the 0 to -3° range.

The author cites Hydrometeorological Instructions (3) which indicate that glazed frost occurs mainly within the 0 to -3° temperature range; A. D. Zamorskiy, who states that same can occur down to -16° (2); and N. S. Shishkin (4), who held that the consolidation of supercooled drops to dimensions of glazed frost can occur by means of the fusion of drops during their collisions in saturated air. There are no graphics in the text. There are 4 references, all of which are Slavic.

Card 3/4

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

AUTHOR: Rusanov, V.I. SOV-26-58-8-18/51

TITLE: Air Temperature Variations Over Many Years in Tomsk (Mnogoletniy khod temperatury vozdukha v Tomske)

PERIODICAL: Priroda, 1958, 47 Nr 8, pp 86-88 (USSR)

ABSTRACT: In Tomsk, Western Siberia, temperature recordings have been made since 1830. The coldest month in Tomsk is January, the warmest July. The average January temperature over the last 100 years is -19.3°C, the coldest January (in 1900) was -28.9°C, the warmest in 1925 with -10.8°C. The lowest temperature was measured on January 6, 1931 with -55°C. The average July temperature is +18.3°C with a maximum of 35.6°C on July 4, 1900. The data allows prognoses as to the long-term temperature changes. A gradual increase mostly in the January temperatures is observed.
There is 1 table and 1 graph.

ASSOCIATION: Tomskiy institut kurortologii i fizioterapii (Tomsk Institute of Balneology and Physical Therapy)

1. Climate--Siberia 2. Atmosphere--Temperature--Statistics

Card 1/1

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RUSANOV, V.I. (Tomsk)

Classification of types of weather for medical purposes. Vop. kur., fizioter. i lech. fiz. kul't. 26 no. 2:177-178 Mr-Ap '61. (MIRA 14:4)

(CLIMATOLOGY, MEDICAL)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V.I.

Distribution of the average annual amount of precipitation in the central Altai. Izv. Vses. geog. ob-va 93 no.6:507-511 N-D '61. (MIRA 15:1)

(Altai Mountains--Precipitation)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V. I., inzh.

Characteristics of turbines operating in the pulse supercharging systems of diesel engines. Trudy KHIIT no.52:35-43 '61. (MIRA 15:10)

(Gas turbines) (Diesel engines)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

YASTREBOV, V.M., kand. tekhn. nauk; RUSANOVA, V.I., starshiy prepodavatel'

Experimental investigation of planetary transmissions with a free pole and single-rim satellites. Izv. vys. ucheb. zav.; mashinostr. no.9:75-78 '65. (MIRA 18:11)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V.M., inzh.

Lightweight panels for the walls and ceilings of compressor and pumping stations. Stroi.truboprov. 6 no.10:28-30 '61.
(MIRA 14:10)

(Asbestos cement) (Pipelines--Buildings and structures)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V.M., kapitan dal'nego plavaniya

Draft of a universal calendar is not faultless. Zem.i vsel. 1 no.2:88-89 Mr-Ap '65. (MIRA 18:8)

1. Chlen Odesskogo otdeleniya Vsesoyuznogo astronomo-geodezicheskogo obshchestva.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

CHERNIYEV, Leonid Fedorovich, dots.; KIRIN, Yuriy Pavlovich; KONDRASHIKHIN, Vladimir Timofeyevich; AKSYUTIN, Leonid Rafionovich; RUSANOV, Valentin Mikhaylovich; YERMOLAYEV, German Grigor'yevich; ANAN'IN, V.I., red.

[Collection of problems in nautical astronomy] Zadachnik po morekhodnoi astronomii. Moskva, Transport, 1964. 338 p. (MIRA 18:5)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V.M.

Simplification of the buoyage system in U.S.S.R. waters. Inform. sbor. TSNIIMF no.66 Sudovozh. i sviaz' no.17:10-15 '61.
(MIRA 16:2)

(Buoys)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

Rusanov, V.N

RUSANOV, V.N. (Leningrad)

Capillaroscopic studies in patients with disorders of vascular tonus. Klin.med. 35[i.e.34] no.1 Supplement:9 Ja '57. (MIRA 11:2)

1. Iz kafedry gospital'noy terapii (nach. - chlen-korrespondent AMN SSSR prof. N.S.Molchanov) Voyenno-meditsinskoy ordena Lenina akademii imeni S.M.Kirova.

(CAPILLARIES) (HYPERTENSION)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V.N., podpolkovnik med. sluzhby

Modification of an apparatus for determination of the resistance of skin capillaries. Voen.-med. zhur. no.6:73-74 Je '58. (MIRA 12:7)
(CAPILLARIES, physiol.
resist. in skin method for determ. (Rus))

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V.N., podpolkovnik meditsinskoy sluzhby

Differential diagnosis of neurocirculatory dystonia and hypertension. Voen.med.zhur. no.3:33-37 '59. (MIRA 12:6)
(NEUROCIRCULATORY ASTHENIA, differ. diag.
hypertension, capillaroscopy & photocapillaroscopy (Rus))
(HYPERTENSION, differ. diag.
neurocirc. asthenia, capillaroscopy & photocapillaroscopy (Rus))

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V.N.

Case of primary lymphogranulomatosis of the bones. Vop. onk. 6 no. 11:89-92 N '60. (MIRA 14:1)
(HODGKIN'S DISEASE) (BONES---TUMORS)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V. N., (Colonel of the Medical Service)

"The Condition of the Basal Metabolism and the Thyroid Function in Neurocirculatory Asthenia"

Voyenno-Meditsinskiv Zhurnal, No. 12, December 1961, pp 62-73

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V.N., polkovnik meditsinskoy sluzhby

Early diagnosis of arteriosclerotic cardiosclerosis in flyers.
Voen.-med. zhur. no.8:56-59 Ag '61. (MIRA 15:2)
(ARTERIOSCLEROSIS) (AVIATION MEDICINE)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V. N., polkovnik meditsinskoy sluzhby

Basic metabolism and function of the thyroid gland in neurocirculatory dystonias. Voen.-med. zhur. no.12:72 D '61.
(MIRA 15:7)

(METABOLISM) (THYROID GLAND)
(BLOOD--CIRCULATION, DISORDERS OF)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

USSR/Human and Animal Physiology (Normal and Pathological) T
Blood Circulation. General Problems.

Abs Jour : Ref Zhur Biol., No 6, 1959, 26521

Author : Rusanov, V.P.
Inst : -
Title : On the Problem of Life Prolongation of an Organism with the Heart Excluded from Blood Circulation.

Orig Pub : Zdravookhr. Kasakhstana, 1958, No 6, 56-61

Abstract : Heart exclusion in dogs was performed by means of successive pressing of azygos and caval veins, which led to decrease of arterial and increase of venous blood pressure. Cardiac contractions became more frequent at first and then became infrequent. Gradually the heart cavity emptied and then filled again with blood (from coronary vessels) and the contractions stopped after 4m. 10 sec - 6m. 10 sec., respiratory movements stopped after 2 min. 25 sec. - 4 min. - 5 sec. It was not possible to restore

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

HUSANOV, V.P.

Pathophysiological changes in the body following the experimental cutting off and restoration of heart action. Trudy Inst.klin.i eksp.khir. AN Kazakh.SSR 5:124-129 '59. (MIRA 13:5)
(HEART)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V. P., Cand Med Sci — (diss) "Survival of the organism during the exclusion of the heart from blood circulation while artificially supplying blood to the brain," Alma-Ata, 1960, 14 pp (Joint Scientific Council of the Institute of Physiology, Regional Pathology, Clinical and Experimental Surgery of the Academy of Sciences KazSSR) (KL, 36-60, 118)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V.P.

Case of celomic cyst of the pericardium. Zdrav.Kazakh. 22 no.7:72-73 '62. (MIRA 16:1)

1. Iz kafedry gospital'noy khirurgii (zav. - dotsent K.Ch. Chuvakov) Semipalatinskogo meditsinskogo instituta.
(PERICARDIUM—TUMORS)(CYSTS)

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4"

"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V.T.; GUR'YEV, I.D., master; KOCHENKOV, V.V., osmotrshchik-avtomatchik; SUKINOV, S.I., osmotrshchik-avtomatchik; SEMENIKHIN, N.A., osmotrshchik-prolazchik; MALYGINA, N.A., slesar'-avtomatchik; MANTAK, A.I., inzh.-tekhnolog; MALOV, G.A., instruktor; POTAPOV, A.L., mashinist elektrovoza; KOVRIZHKIN, N.P.; PATEYUK, I.L., starshiy inzh. po tormozam

Discussion of Boiko and Senderov's article "Is there a need for emergency braking boosters on freight trains?" Elek.i tepl. tiaga 5 no.12:26-27 D '61. (MIRA 15:1)

1. Punkt tekhnicheskogo osmotra stantsii Magnitogorsk Yuzhno-Ural'skoy dorogi. 2. Nachal'nik punkta tekhnicheskogo osmotra stantsii Magnitogorsk Yuzhno-Ural'skoy dorogi (for Rusanov). 3. Depo Tuapse Severo-Kavkazskoy dorogi (for Potapov). 4. Starshiy revizor sluzhby lokomotivnogo khozyaystva Moskovskoy dorogi (for Kovrizhkin). 5. Sluzhba vagonnogo khozyaystva Moskovskoy dorogi (for Pateyuk).
(Railroads--Brakes)

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V. V.

"Calculation of the Spatial Supersonic Currents of Gas by the Method of Characteristics." Sub 3 Oct 51, Military Air Engineering Academy imeni N. Ye. Zhukovskiy

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May 55

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16.3500, 16.3900, 16.4100

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E031/E435

AUTHOR: Rusanov, V.V.

TITLE: On the Stability of the Method of Matrix Factorization

PERIODICAL: Akademiya nauk SSSR. Vychislitel'nyy tsentr. Vychislitel'naya matematika; sbornik, No.6, 1960, pp.74-83

TEXT: In solving partial differential equations by finite difference methods, it is frequently necessary to solve systems of linear algebraic equations in which the unknowns are grouped into sets of a certain size so that we can write

$$a_0^{(i)}\bar{w}_i + a_1^{(i)}\bar{w}_{i+1} + \ldots + a_k^{(i)}\bar{w}_{i+k} = \bar{\pi}^{(i)}, \qquad (1)$$

where the $a_j^{(i)}$ are square matrices, the $\bar{w}_j$ are the unknowns and $\bar{\pi}^{(i)}$ is a column vector. There are also supplementary equations derived from the boundary conditions which can be written in the form

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On the Stability of ...

$$g_0^{(0)}\bar{w}_0 + \ldots + g_{k-1}^{(0)}\bar{w}_{k-1} = \gamma^{(0)}$$

$$g_{m-k+1}^{m-k+1}\bar{w}_{m-k+1} + \ldots g_m^{m-k+1}\bar{w}_m = \gamma^{m-k+1}, \qquad (2)$$

It is shown that the system (1) and (2) can always be replaced by a cononical equivalent system in which $k = 1$ and the number of unknowns in each group is increased from ℓ (say) to $L = k\ell$. To solve a system of the form (1) it is convenient to use the method of matrix factorization (G.I.Marchuk, Ref.3), but the question of stability arises. K.I.Babenko and N.N.Chentsov have studied a particular case. To obtain general stability criteria it is convenient to make the investigation without any assumptions as to the origin of the system of equations. The restrictions imposed by the investigation on the matrices are, as a rule, satisfied by systems obtained from a correctly posed problem. For convenience of description, the system (1) and (2) is replaced by one in which $k = 1$

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$$a_{l+1}\bar{w}_{l+1} + b_l\bar{w}_l = \bar{\pi}_{l+\frac{1}{2}},\ i = 0, 1, \ldots, m-1, \tag{6}$$

$$g_0\bar{w}_0 = \bar{\gamma}_0 \tag{7a}$$

$$h_m\bar{w}_m = \chi_m. \tag{7b}$$

Using Eq.(7a) and (6), a set of relations similar to (7a) for i = 1,2,...,m is obtained which are solved for any l_1 components w_i. This is called the "forward step" of the factorization. The factorization coefficients are calculated recursively. The forward step requires m inversions of l-th order matrices which, accordingly, must be non-singular and, for practical reasons, well-conditioned. In considering the stability it will, for simplicity, be assumed that the error arises only for i = 0 and i = m and that it is concentrated in h_m, χ_m and in only two of the factorization coefficients. The proof of the following theorem is indicated: let the factorization coefficients $x_{js,i}$ and the vector $\bar{\varphi}_{j,i+1/2}$ (Eq.(12)) be bounded

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in norm for all i, and for all i, let the inequality

$$\| \omega_{11,l+j,l} \| \leqslant N_1 q_1^l, \quad \| \omega_{22;l,l+j} \| \leqslant N_2 q_2^l, \tag{17}$$

where N_1 and N_2 do not depend on i and j and the ω are products of certain of the factorization coefficients. Then for $q_1 q_2 < 1$ the forward step is stable and for $q_1 \leqslant 1$, $q_2 < 1$ the reverse step is stable. In this form the theorem is not of great practical use and it is more useful to work with the canonical form of the system referred to above. In this case the coefficients $x_{js,i}$ can be calculated explicitly and are constants. The stability conditions are now easily derived and are easy to apply. The conditions of the theorem hold for the general system if they hold for the canonical one. A theorem stating the sufficient conditions for stability is stated without proof. Restrictions are laid on the form of the matrices a and b in Eq.(6) and (7), on the form of the boundary conditions in the

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E031/E435

On the Stability of ...

canonical system and on the number of boundary conditions.
There are 3 Soviet references.

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

32378
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D237/D304

26.2114

AUTHOR: Rusanov, V. V.

TITLE: Calculation of the interaction between non-stationary shock-waves and obstructions

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 12, 1961, 19-20, abstract 12B104 (Zh. vychisl. matem. i matem. fiz., 1961, 1, no. 2, 267-279)

TEXT: A difference method of the numerical solution of two-dimensional, plane and axially symmetrical non-stationary gas-dynamical problems involving shock-waves is described. A "skew count" is permitted. The "skew count" method was proposed by a number of authors for numerical solutions of shock-wave problems. The difference method is evolved in such a manner as to allow calculations without considering discontinuities ("through" them). Discontinuities appear in calculations as positions of sharp changes in gas-dynamic magnitudes. Although in one-dimensional

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Calculation of the...

problems Lagrangian coordinates are more suitable (as the dispersion of contact discontinuities does not occur), in the two-dimensional case their application complicates the calculations and leads to increased errors. Hence, in two-dimensional problems, for the schemes with skew count, Eulerian coordinates are employed. In this case, tangential discontinuities strongly disperse, but, until now, no scheme was found free from this limitation. A difference scheme is constructed with rectangular coordinate-time net. Only such problems are considered in which all the walls are rectilinear and pass through the points of the net either in the direction parallel to coordinate axes or along the diagonal of the cell. The stability of the difference scheme is investigated. A number of problems on the interaction between plane shock-waves and obstacles of various shapes is solved by the method described above. The first group of problems includes those of various types of diffractions of the plane shock-wave on the infinite angle: (1) Reflection of the shock-wave from the wedge (straight one, and one with formation of triple point); (2) interaction of the shock-wave with a right angle (slipping of

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Calculation of the...

the shock-wave on the right angle and its reflection from it). All these problems are length invariant. Solution results are presented graphically in homogeneous coordinates, and the curves of constant density and pressure are plotted. In the numerical solution, invariance with respect to length disappears due to dispersion of the shock-wave; at the limit, however, when $t \to \infty$, the corresponding distance of dispersion of the shock-wave tends to zero, and the solution becomes distance invariant. This is seen from the graphs in homogeneous coordinates: $\xi = x/Dt$, $\eta = y/Dt$ (D = velocity of the shock-wave). At $t \to \infty$, curves of constant density and pressure coincide at various times. The second group of problems includes calculations of two cases of motion of the shock-wave in a circular tube, with a semi-finite cylinder placed inside it in such a manner that an annular cavity is formed between the walls of the tube and the cylinder. The emergence of the shock-wave from the annular cavity and entry of the shock-wave from the tube into the annular cavity with partial reflection from the top of the cylinder were calculated. Flows

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are not length invariant (length parameters are: radii of the tube and the cylinder). Graphs are given of the curves of constant density and pressure for definite values of time. [Abstracter's note: Complete translation.]

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S/020/61/136/001/005/037
C111/C222

16.3900

AUTHOR: Rusanov, V.V.

TITLE: The Solution of Simultaneous Difference Equations

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 1, pp.33-35

TEXT: Let the solution of a system of difference equations lead to the following algebraic system :

$$(1)\quad \begin{cases} g_1 \vec{w}^{(1)} = \vec{\gamma}_1 \\ a_{i+1} \vec{w}^{(i+1)} + b_i \vec{w}^{(i)} = \vec{\varphi}_{i+1/2} \\ g_M \vec{w}^{(M)} = \vec{\gamma}_M \end{cases},$$

where $\vec{w}^{(i)}$ $(i = \overline{1,M})$ are vectors with the components $w_k^{(i)}$ $(k = \overline{1,L})$; a_{i+1}, b_i $(i = \overline{1,M-1})$ are quadratic $L \times L$-matrices ; g_1 is an $L_1 \times L$-matrix ; g_M is an $L_M \times L$-matrix ; $L_1 + L_M = L$; $\vec{\gamma}_1$ and $\vec{\gamma}_M$ are vectors with L_1

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The Solution of Simultaneous Difference Equations

and L_M components, respectively.

Let $\vec{W} = \left\{ \vec{w}^{(1)}, \vec{w}^{(2)}, \ldots, \vec{w}^{(M)} \right\}$ be a vector consisting of all unknowns. $\vec{W}$ is the solution of

(2) $$A\vec{W} = \vec{P}$$

where

(3) $$A = \begin{Bmatrix} g_1 & 0 & 0 \ldots 0 & 0 \\ b_1 & a_2 & 0 \ldots 0 & 0 \\ 0 & b_2 & a_3 \ldots 0 & 0 \\ \vdots & \vdots & \vdots \quad \vdots & \vdots \\ 0 & 0 & 0 \ldots b_{M-1} & a_M \\ 0 & 0 & 0 \ldots 0 & g_M \end{Bmatrix}, \quad P = \begin{Bmatrix} \vec{\gamma}_1 \\ \vec{\pi}_{1/2} \\ \vec{\pi}_{2/2} \\ \vdots \\ \vec{\pi}_{M-1/2} \\ \gamma_M \end{Bmatrix}. \qquad (3)$$

For the solution of (2) the author proposes the following method : the solution is carried out in two steps. The first one (direct way) consists in the elimination of the unknowns and reduction of A to a triangular form.

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The Solution of Simultaneous Difference Equations

The second one (return) consists in the determination of the solution by inverse substitutions.
The choice of the principal elements and the elimination of the unknowns is carried out in the following sequence :
1) L_1 principal elements are chosen successively from g_1. Every unknown of the L_1 chosen ones remains with the coefficient 1 only in one row of g_1 and is eliminated out of the other rows. Besides all L_1 chosen unknowns are eliminated out of the following L equations so that in b_1 the principal columns contain only zero. The remaining elements of g_1 with the data of the numbers of the principal rows and columns are noted for the return.
2) From the remaining L_M columns of b_1 being different from zero, L_M principal elements are successively chosen, and the corresponding unknowns are eliminated out of the other equations. Finally, in b_1 there remain only L_M ones namely just one in each of the L_M principal rows.
3) L_1 principal elements are chosen out of L_1 rows of a_2 which were no

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The Solution of Simultaneous Difference Equations

principal rows of the preceding step.; the corresponding unknowns are eliminated out of all rows of a_2 and b_2 (except of one row of a_2 in which the unknown with the coefficient 1 is remaining). The remaining elements of a_2 and their digits are noted.

2) and 3) are repeated for b_2 , a_3 , b_3 , ... up to a_M.

4) L_M principal elements are chosen out of the remaining L_M columns and rows of g_M being different from zero. In this way L_M components of $\vec{w}^{(M)}$ are determined. In the return $\vec{w}^{(M)}$, $\vec{w}^{(M-1)}$, ... $\vec{w}^{(1)}$ are determined successively with the aid of the noted parts of the transformed matrices a_i .

There are 2 Soviet references.

PRESENTED: July 7, 1960, by M.V. Keldysh, Academician
SUBMITTED: June 2, 1960

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"APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001446110019-4

RUSANOV, V.V. (Moskva)

Characteristics of the general equations of gas dynamics. Zhur. vych. mat. i mat. fiz. 3 no.3:508-527 My-Je '63. (MIRA 16:5)
(Gas dynamics)

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L 51051-65 EWT(1)/EWP(m)/EWA(d)/FCS(k)/EWA(1) Pd-1 S/ 36 B+1
ACCESSION NR AM5005931 BOOK EXPLOITATION

Babenko, Konstantin Ivanovich (Professor); Voskresenskiy, Georgiy Pavlovich; Lyubimov, Aleksandr Nikolayevich; Rusanov, Viktor Vladimirovich

Spatial flow of ideal gas around cones (Prostranstvennoye obtekaniye gladkikh tel ideal'nym gazom), Moscow, Izd-vo "Nauka", 1964, 505 p. illus., tables. Errata printed on the inside of back cover. 3,500 copies printed.

TOPIC TAGS: ideal gas flow, gas dynamics, supersonic flow, axisymmetric flow, mathematics, computer programming, aerodynamics

PURPOSE AND COVERAGE: This book is devoted to an actual problem of modern gas dynamics--calculating the field of flow around a smooth body placed arbitrarily in relation to the direction of air flow. The book cites the results of research conducted for a number of years between authors on the development and practical application of a method of finite differences for solution of spatial problems of gas dynamics on electronic digital computers. The first chapter is a detailed presen..tion of the method of spatial flow around sharp bodies by a supersonic ..as flow. A number of sections of the first chapter contain theoretical re- ..earch on ..ystems of finite difference equations conducted with a consideration ... applying the method to contain problems of mechanical and mathematical

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physics. The second chapter presents the results of calculations of non-axisymmetric flow around several rotating bodies with and without consideration of chemical regulations in the flow. The third chapter contains tables of nonaxisymmetric flow around round cones in a wide range of machine numbers, angles of semisolution of the cones and angles of attack. The tables present exhaustive information on gas flow and can be used in practical work. The book is intended for researchers and engineers concerned with computer mathematics and programming, aerodynamics of flying craft and theoretical gas dynamics. The book can also be useful to teachers, advanced students and graduate students of higher educational institutions.

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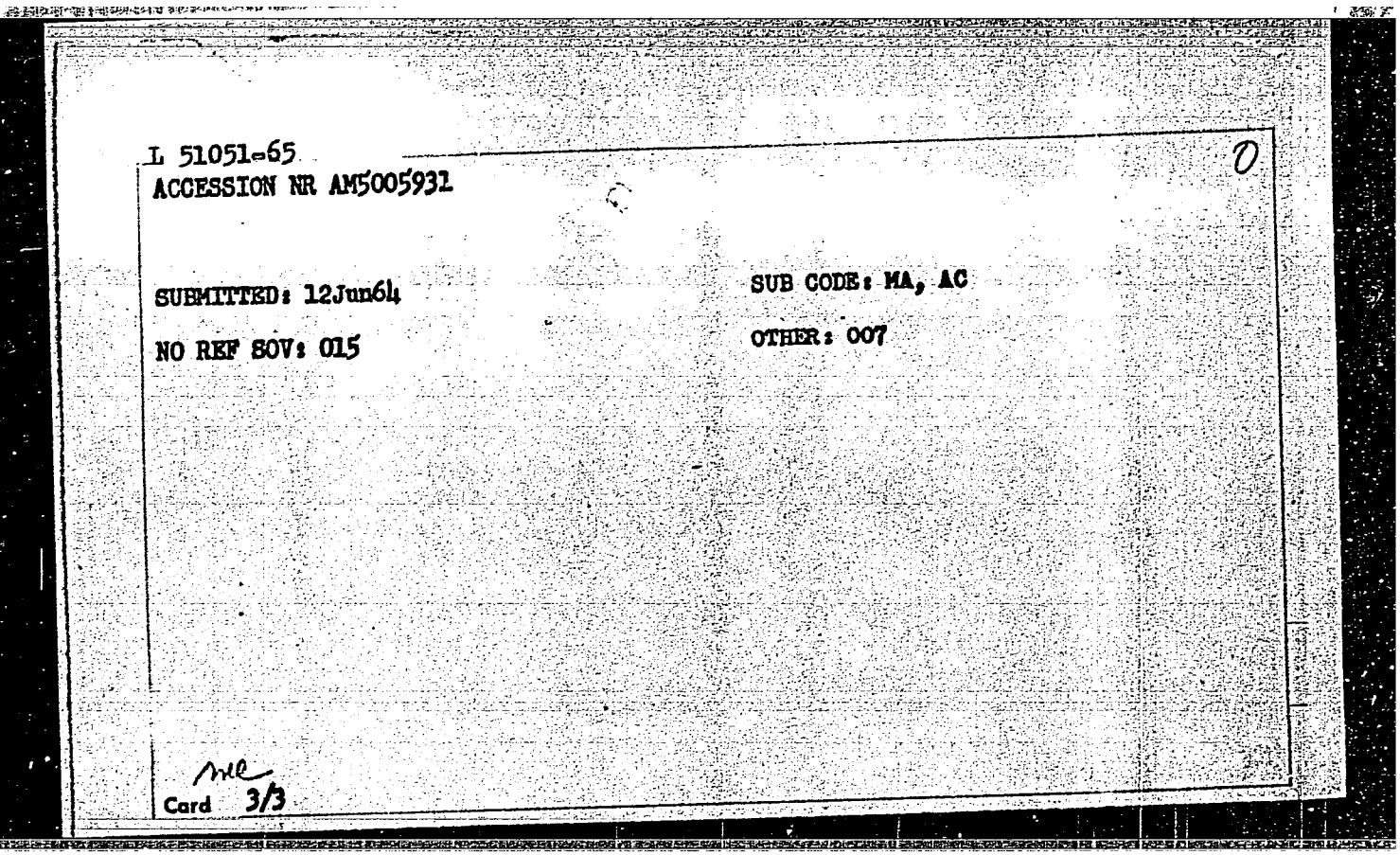

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KUZNETSOV, Nikolay Nikolayevich; RUSANOV, Viktor Vladimirovich; SYSOYEVA, N.V., red.

[Computer mathematics; methods of approximate computation. Modern computers and programming. Methodological instructions for fifth-year correspondence students of mechanics and mathematics faculties of State universities] Vychislitel'naia matematika; metody priblizhennykh vychislenii. Sovremennye vychislitel'nye mashiny i programmirovanie. Metodicheskie ukazaniia dlia studentov-zaochnikov V kursa mekhaniko-matematicheskikh fakul'tetov gosudarstvennykh universitetov. Moskva, Izd-vo Mosk. univ., 1964. 48 p. (MIRA 18:4)

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[illegible], Konstantin Ivanovich; VOSKRESENSKIY, Georgiy Pavlovich; YUSHKOV, Aleksandr Nikolayevich; RUSANOV, Viktor Vladimirovich

[Three-dimensional flow of an ideal gas past smooth bodies] Prostranstvennoe obtekanie gladkikh tel ideal'nym gazom. Moskva, Nauka, 1964. 505 p. (MIRA 17:8)

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RUSANOV, V. V.

"A three-dimensional supersonic gas flow past smooth blunt bodies."

report submitted for 11th Intl Cong of Theoretical & Applied Mechanics & General Assembly, Munich, 30 Aug-5 Sep 64.

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RUSANOV, Vladimir Vasil'yevich; POSPELOV, I.I., retsenzent; SELEZNEV, A.I., retsenzent; LOBENSKIY, O.S., red.; LOBANOV, Ye.M., red.

[Maintenance and running repair of electrical and radio navigation equipment on ships of the river fleet] Profilaktika i tekushchii remont elektroradionavigatsionnoi apparatury na sudakh rechnogo flota. Moskva, Transport, 1964. 103 p. (MIRA 17:11)

1. Inzhener sluzhby svyazi Volzhskogo ob"yedinennogo rechnogo parokhodstva (for Pospelov, Seleznev).

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L 8408-65 EWT(1)/EPA(b)/EPR/FCS(k)/EWA(1) Pd-4/Ps-4 AFWL/AS(mp)-2/SSD/ASD(f)/ASD(p)-3/AEDC(a)/AFETR/ESD(gs) WW

ACCESSION NR: AP3001103 S/0208/63/003/003/0508/0527

AUTHOR: Rusanov, V. V. (Moscow)

TITLE: Characteristics of general equations in gas dynamics

SOURCE: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 3, no. 3, 1963, 508-527

TOPIC TAGS: method of characteristics, gas dynamics, entropy, hypersurface, vector space, quasilinear equation

ABSTRACT: The general characteristics of unsteady, three-dimensional, inviscid and non-heat-conducting gases were investigated analytically. In part one, the characteristics solution and the general properties of quasilinear equations of the type

$$\sum_{j=1}^{m}\sum_{k=1}^{n} a_{ijk}\frac{\partial u_j}{\partial x_k}=F_i \qquad (i=1,2,\ldots,m) \tag{1}$$

were considered. The coefficients a_{ijk} and F_i are functions of x_k and u_j. The equation of characteristics for the above expression is expressed in terms of the normal vector N

$$\chi\equiv\operatorname{Det}(a_{ij}\cdot N)_{i,j=1}^{m}\equiv\operatorname{Det}\left\{\sum_{k=1}^{n}a_{ijk}N_k\right\}_{i,j=1}^{m}=0 \tag{2}$$

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At a given point $M(x_1 \ldots\ldots x_n)$ the equation $\chi(N_1 \ldots\ldots N_n) = 0$ leads to the system of characteristic equations $\chi(N_1, \ldots\ldots N_{n-1}, 0) = 0$; thus the hypercone normal in $x_1 \ldots\ldots x_{n-1}$ space is the intersection of hypercone normal in $x_1, \ldots\ldots x_n$ space with hyperplane x_n = const passing through the hypercone vertex. Furthermore, in subspace $x_1, \ldots\ldots, x_{n-1}$, the half-lines v corresponding to the normal n are represented by

$$v_k = \lambda \frac{\partial}{\partial N_k} \chi(N_1, \ldots, N_{n-1}, 0) \quad (k = 1, 2, \ldots, n-1); \tag{3}$$

Then, the characteristic lines of the hypercone in $x_1, \ldots\ldots, x_{n-1}$ are projections on hyperplane x_n = const of those lines V which correspond to characteristic normal N, parallel to the hypercone x_n = const. In part two, the above general method of characteristics is applied to the three-dimensional flow of ideal gases governed by the equations

$$\left.\begin{aligned} \rho \frac{du}{dt} + \operatorname{grad} p &= 0, \\ \frac{d\rho}{dt} + \rho \operatorname{div} u &= 0, \\ \frac{dS}{dt} &= 0. \end{aligned}\right\} \tag{4}$$

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Writing the above in the generalized notation of equation 1, with $u_x = u_1$, $u_y = u_2$, $u_z = u_3$, $p = u_4$, $\rho = u_5$, then $n = 4$, and $m = 5$. The equation of characteristics is represented by

$$\chi \equiv \rho^2\Psi^2(N\cdot\Theta) \equiv \rho^2\Psi^2\Phi = 0, \quad \Phi \equiv \Psi^2 - a^2n^2 \tag{5}$$

where $n = N_1, N_2, N_3, 0$, $U = u_1, u_2, u_3, 1$ and $\Psi = U\cdot N$. The geometry of hypercone characteristics is discussed for $\Phi = 0$ and $\Psi = 0$. A set of conditions is stated establishing the interdependence of various characteristic relations. The conservation of entropy condition is shown to be independent from the rest of the equation of characteristics. The maximum number of independent characteristic expressions on a given number of hyperplane flows is set at four, and four independent relations on wave hyperplanes together with entropy conservation condition constitute a complete system on any hyperplane flow. Finally, relations on one wave hyperplane and one hyperplane flow always contain four independent relations. In the third part of the paper the simplified case of steady flow is considered with $u_j \neq f(t)$. The equation of the cone normal then yields

$$\Psi = m\cdot u = u_1m_1 + u_2m_2 + u_3m_3 = 0, \quad \Psi = n\cdot u = n_t, \quad n^2 = 1. \tag{6}$$

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Orig. art. has: 52 equations.

ASSOCIATION: none

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BABENKO, K.I.; RUSANOV, V.V. (Moscow)

"The finite difference methods of solving three-dimensional problems of gas dynamics"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 January - 5 February 1964

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RUSANOV, Ye.

Distribution and utilization of the labor supply in the U.S.S.R. in the seven-year plan. Sots.trud 6 no.3:19-26 Mr '61. (MIRA 14:3)
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KASITSKIY, I.; MANEVICH, Ye.; ZVEREV, A.; KAPUSTIN, Ye.; NEMCHINOV, V., akademik; VOROB'YEVA, A.; YEVSTAF'YEV, G.; SHAKHURIN, A.; KOSYACHENKO, G.; PLOTNIKOV, K.; AL'TER, L.; ROTSHTEYN, L.; SPIRIDONOVA, N.; MASLOVA, N.; RUSANOV, Ye.; KAPITONOV, B.; KULIYEV, T.; GATOVSKIY, L.

Problems of the economic stimulation of enterprises. Vop. ekon. no.11:87-142 N '62. (MIRA 15:11)

1. Komitet Vsesoyuznogo soveta nauchno-tekhnicheskikh obshchestv po ekonomike i organizatsii proizvodstva (for Kasitskiy). 2. Institut ekonomiki AN SSSR for Manivich, Zverev, Vorob'yeva, Yevstaf'yev, Shakhurin, Plotnikov, Maslova, Rusanov, Kapitonov). 3. Nauchno-issledovatel'skiy institut truda (for Kapustin). 4. Nauchno-issledovatel'skiy finansovyy institut (for Kosyachenko). 5. Nauchno-issledovatel'skiy ekonomicheskiy institut Gosudarstvennyy nauchno-ekonomicheskogo soveta Soveta Ministrov SSSR (for Al'ter).

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6. Gosudarstvennyy nauchno-ekonomicheskiy sovet Soveta Ministrov SSSR (for Rotshteyn). 7. Moskovskiy gosudarstvennyy universitet (for Spiridonova). 8. Azerbaydzhanskiy gosudarstvennyy universitet imeni S.M. Kirova (for Kuliyev). 9. Predsedatel' Nauchnogo soveta po khozyaystvennomu raschetu i material'nomu stimulirovaniyu proizvodstva, chlen-korrespondent AN SSSR (for Gatovskiy).
(Industrial management)
(Incentives in industry)

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KANDILETIS, P.G., aspirant; RUSANOV, Ye.L.

Methodology of determining volatile fatty acids in the gastric juice. Med. zhur. Uzb. no.6:49-52 Je'63 (MIRA 17:3)

1. Iz kafedry fakul'tetskoy terapii ' zav. - prof. A.A. Askarov) lechebnogo fakul'teta i kafedry mikrobiologii (zav. - prof. P.F. Samsonov) Tashkentskogo meditsinskogo instituta.

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